Hence the exudate, or the plant, strictly speaking, cannot be called "insecticidal" any more properly than "insectivorous." The peculiar attractiveness above noted doubtless serves the plant some special purpose, and until the real nature of this is determined the designation given in the heading must of course be understood as provisional.

Mr. Howard then presented a paper entitled—

THE HYMENOPTEROUS PARASITES OF SPIDERS.

By L. O. Howard.

I have for some time been interested in the subject indicated by the title of this paper and have published several short notes with descriptions of species in the first three volumes of *Insect Life*. Material has accumulated on my hands, however, to such an extent that I have thought it well to bring it all together into convenient and accessible shape. The biological facts here given have been transmitted to Rev. H. C. McCook for publication in the third volume of his large work upon "Spiders and Their Spinning Work." A systematic statement, however, is given below with descriptions of all new species and all of the facts so far connected with their life histories except where previously published. In the latter case references are given. I have followed this statement with a tabular list of the European hymenopterous parasites of spiders so far as I have been able to find them recorded. This list is taken from a manuscript catalogue of the host relations of parasitic Hymenoptera upon which I have been engaged for some time. It should be stated concerning this list that the bibliographical references in the third column do not give in many cases the name of the original observer or even the reference to the first publication, as I have, in order to save time, catalogued mainly published lists of host relations, thus taking advantage of the compilation work done by other workers. As a result Blackwall's rearings, for instance, while not credited in the reference column to that author, may appear under Bridgman or Fitch or some other author, as the case may be. I have confined myself to the consideration of the hymenopterous parasites, although several Diptera are known to infest spiders and their cocoons; thus certain flies of the Muscid genus Leucopis are said by Schiner to live in the nests of spiders, while Menge states that the larva of Oncodes inhabits the sac of Clubiona and devours the spider. Moreover, the curious hypermetamorphoses of Mantispa have been proved by Brauer to take place in the egg sacs of spiders of the genus Lycosa.

Nos. 17 to 21, inclusive, of the American list, belonging to the Ichneumonid genus Hemiteles and the Chalcidid genus Eupelmus have been kindly described for me by Prof. Riley, on account of his particular interest in these two genera.

American Hymenopterous Parasites.

1. **Polysphincta** sp.

A larva which was not reared to the adult, but which probably belonged to Polysphincta, was found feeding externally upon *Steadota borealis* Hentz in the District of Columbia. W. H. Fox collector.

See *Insect Life*, Vol. I, p. 42.

2. **Polysphincta (Zatypota) dictynæ** How. *Insect Life*, Vol. I, p. 106.

This species was reared from a larva feeding externally upon *Dictyna volupis* by J. H. Emerton, at Waltham, Mass.

3. **Polysphincta (Zatytopa) strigis** n. sp.

Female.—Length, 5 mm.; expanse, 10 mm. Body black, with delicate whitish pubescence; mesonotum and mesopleura dark honey-yellow, mesoscutum with three dark longitudinal bands; all coxæ and trochanters, front and middle femora, and front tibiæ and tarsi light ochre-yellow; middle tibiæ with a brown band at tip; tarsi brown, except base of first joint; hind femora brown above, whitish below; basal three-fourths of hind tibiæ whitish, apical fourth dark brown, nearly black, with a brownish spot near base above; hind tarsi dark brown except base of first joint, which is whitish; abdomen yellowish below at base; palpi yellowish white; mandibles brown at base and extreme tip, otherwise yellowish; clypeus brown; wing veins dark brown; tegulæ yellowish white. Abdomen nearly smooth; terebra exserted to a length equal to the last three joints of the abdomen. No trace of a cubital cross-vein in the forewings, although the cubital vein is bent at quite a sharp angle. Fifth tarsal joint subtriangular in shape, about as long as third; pulvillus large. Metascutellum with two longitudinal median carinæ, slightly diverting posteriorly.

Described from one female specimen.

The larva of this species was found feeding externally upon *Epeira strix* by Nathan Banks at Sea Cliff, Long Island, May 11, 1891. At the time of capture the parasitic larva was considerably larger than the spider. The larva spun up May 14. When brought to me, May 18, the cocoon was completed in the vial in which Mr. Banks had placed the specimen. The cocoon was of a densely spun yellow-brown silk, 6 mm. long, cylindrical, 2 mm. in diameter, and rounded at both ends. It was suspended by a loose band of darker colored, coarser silk 7 mm. long, and

from the end of this band a few threads reached to the bottom (27 mm.) and sides of the vial. At the opposite end of the cocoon from the supporting band were 7 oblong, black excremental pellets evidently extruded by the larva before closing itself in the cocoon. The abdomen of the spider was reduced to almost nothing, but the cephalothorax and legs remained natural. May 25 the adult issued from the opposite end of the cocoon from the excrement.

The cocoon of *P. dictynæ* mentioned above was of about the same size and had a smaller supporting band, but was composed of white silk and was much more delicate (nearly transparent).

4. **Polysphincta** sp.

Larva not reared. Feeding externally upon the abdomen of *Linyphia communis* Hentz. Collected at Beverly, Mass., August 28, 1869, by J. H. Emerton.

5. **Polysphincta** sp.

Shrunken larva only. Found in cocoon attached to dead spider of the Attid genus Icius. Collected at Eastport, Maine, August 18, 1872, by J. H. Emerton.

6. **Polysphincta** sp.

Larva not reared. Collected on the dorsum of *Theridium spirale* (?) by J. H. Emerton. (Neither date nor location.)

7. **Polysphincta** sp.

Known only by the larva, which was found attached to a specimen of *Pardosa luteola* Marx in a collection of spiders from Ounalaska.

8. **Polysphincta theridii** n. sp.

Length, 5.4 mm.; expanse, 8 mm. Belongs to the true genus *Polysphincta* as differentiated from *Zatypota* Förster, *Oxyrrhexis* Först. and *Zaglyptus* Först. by Schmiedeknecht's tables (Zool. Jahrbücher III, 3, 432-3). The cubital cross-vein is represented by a distinct stump closely proximad of the angle of the cubital, which is slightly marked. Metascutellum with two parallel median longitudinal carinæ diverging widely behind and bordering a pentagonal space which is slightly and irregularly longitudinally ridged; first segment of abdomen with two dorsal median longitudinal subparallel carinæ diverging anteriorly and converging at posterior end of segment to form a distinct tubercle; second and subsequent abdominal segments each with a well-defined finely punctate space shaped much like the black markings on the abdomen of *P. (Zatypota) dictynæ* (See fig. 1). General color dull black; all legs uniform honey-yellow, except that hind tibiæ are brown at the tips; scape and pedicel of antennæ honey-yellow; palpi honey-yellow, clypeus darker.

Described from two ♂ specimens received from J. H. Emerton, and each labelled "from cocoon in nest of Theridium, Eastport,

Me., August, 1872." Both specimens are in bad condition and are covered with a chalk-like deposit and bits of spider's silk.

9. **Polysphincta (Zaglyptus) koebelei** n. sp.

Female.—Length, 8 mm.; expanse, 11 mm. Resembles quite strongly *P.* (*Zatypota*) *strigis*, except in the main structural character that the cubital cross-vein is plainly represented by a short stump, just proximad of the angle in the cubital. The subparallel metascutellar carinæ are also lacking, this sclerite being marked only by a delicate median longitudinal impression which is lacking on the apical half. The plan of coloration is the same, but the following differences may be noted: hind coxæ black at base; all other crural sclerites uniform honey-yellow; mesonotum of a more uniform and lighter honey-yellow; metascutum honey-yellow.

Described from one female specimen received from A. Koebele, and labelled "Santa Cruz Mountains, Calif." Upon the tag with the specimen is the shrivelled body of a spider upon which it is fair to presume that the parasitic larva had been feeding, the more especially since the spider's abdomen has been destroyed. Attached to the same pin is what is evidently the cocoon of the parasite. It is 7.5 mm. long and 3.8 mm. wide, is rather loosely spun (so as to be translucent) of light brown silk. The spider has been determined from its remains by Dr. Marx as *Epeira strix* or *E. scolopetaria.*

Other references to the interesting external parasites of the Polysphincta group will be found under the head of "European Parasites." Still others will be found in the original note in *Insect Life*, Volume I, p 43. It was supposed at the time that this was the first American record of an external spider parasite, but Mr. Schwarz has recently called my attention to a note in the Proceedings of the Boston Society of Natural History for 1871, Volume XIV, p. 388, which reads: "Mr. F. G. Sanborn reported a recent capture of a spider of the genus Lycosa (?) upon which was a parasitic larva apparently dipterous."

10. **Pimpla rufopectus** Cresson. *Trans. Am. Ent. Soc.* III, p. 148.

Three female specimens reared from spider's egg-bag (probably Epeirid), Alameda county, Cal., June 10, 1887, by A. Koebele. (See *Insect Life*, Vol. III, p. 461.) Also reared by W. H. Patton in Connecticut, in May, from the cocoon of an Epeirid spider. Also two females reared in the District of Columbia by O. Heidemann. Three female specimens reared from an egg-bag of *Argiope riparia*, February 22, 1889. Received from H. C. Wells, Short Hills, N. J. (See *Insect Life*, Vol. I, p. 324, where it is named *P. inquisitor.*) This is also the species referred to by Dr. Burt G. Wilder in the Proceedings of the A. A. A. S. for 1873, p. 257, and also in a popular article in *Harpers'*